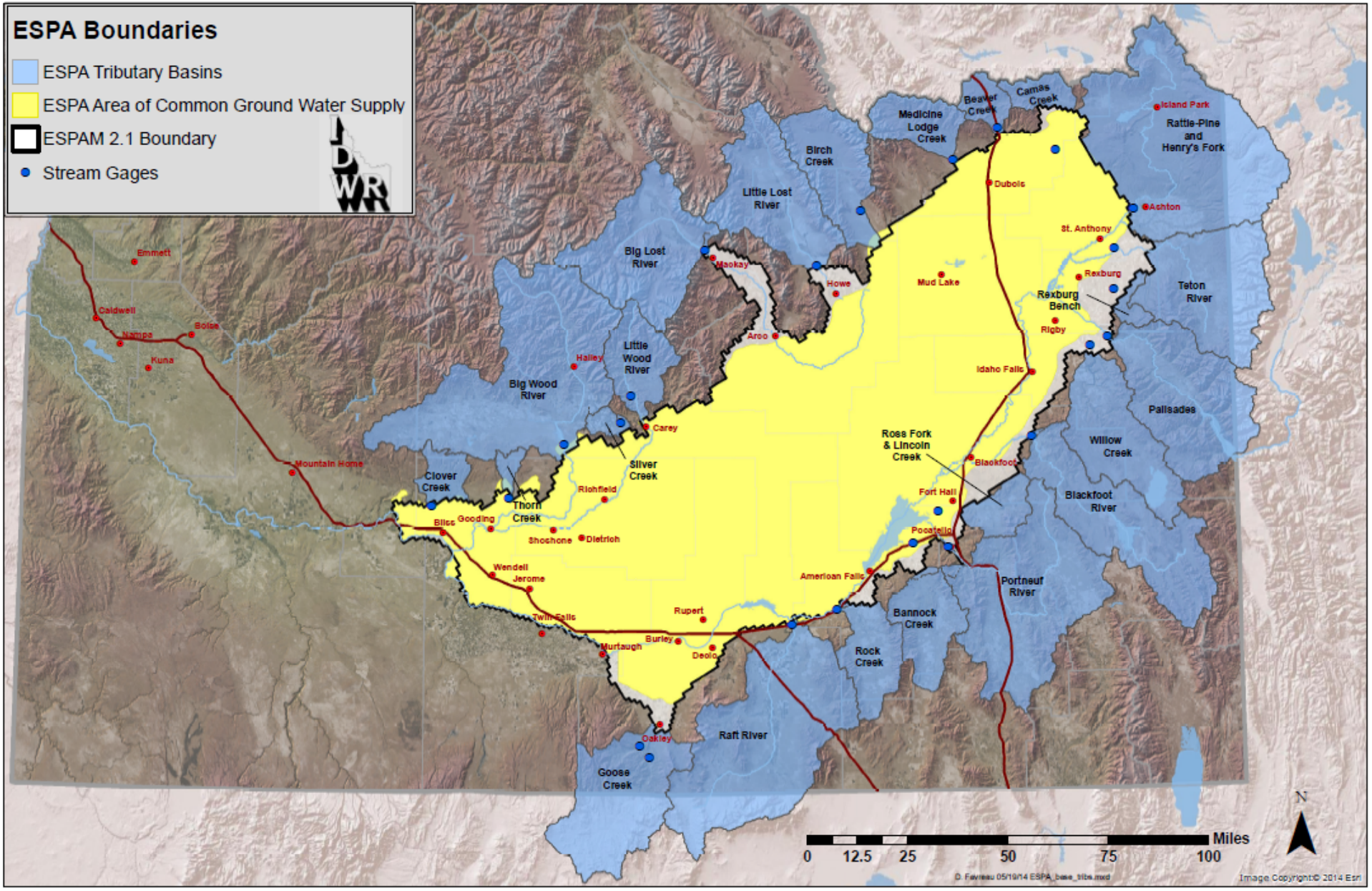

# Addressing a History of ESPA Declines: Aquifer History, Delivery Calls, & Settlement

Presented at Natural Resources Interim Committee

October 16, 2015

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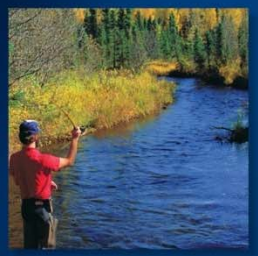
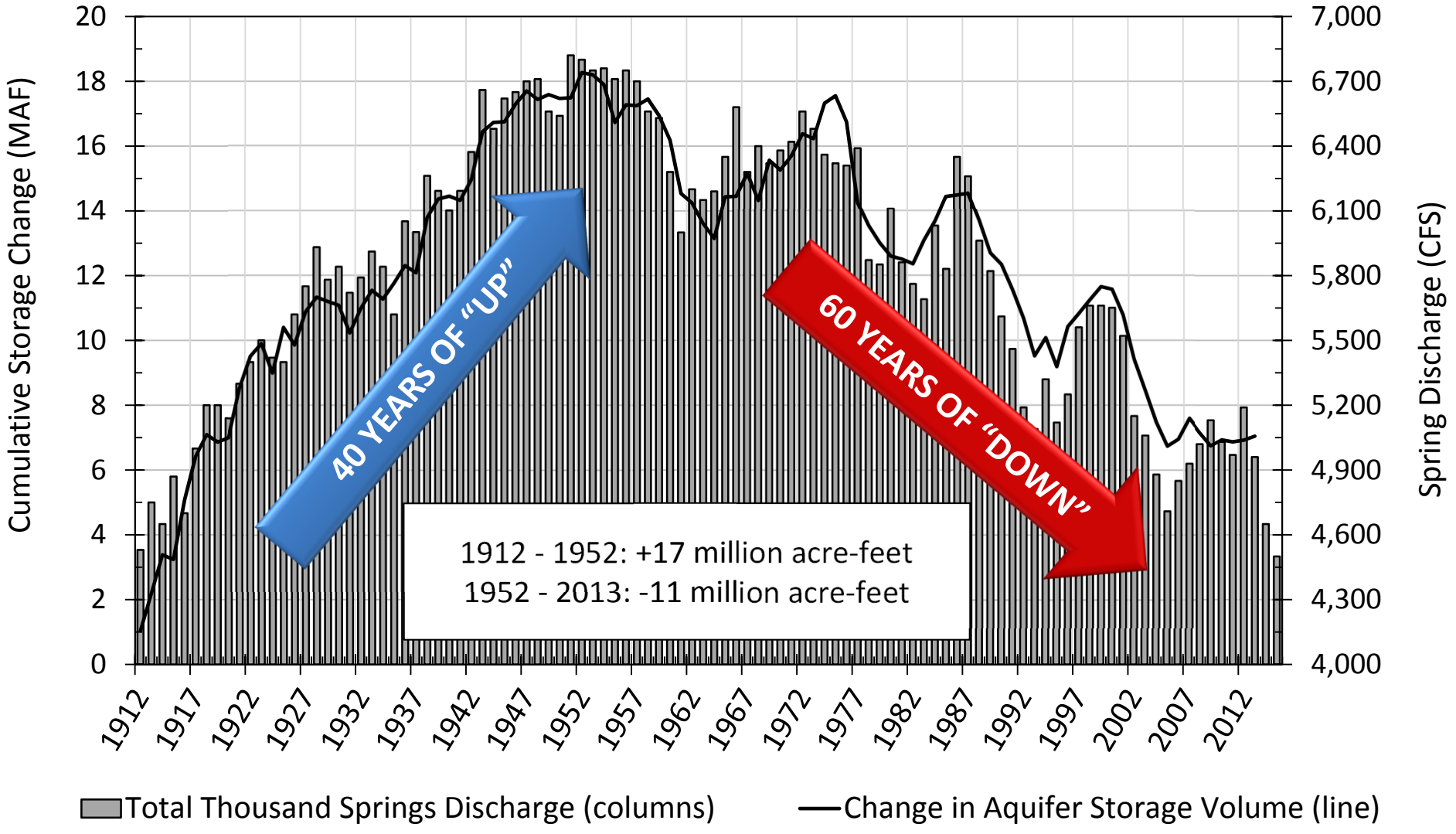


# ESPA Factoids

- 2.1 million irrigated acres on the ESPA (60% of Idaho's total): 871K acres surface water; 889K acres ground water; and 348K acres mixed sources. (2009, *ESPA CAMP)*
- *~50% of Idaho's power needs are met by hydropower supplied from the ESPA-Snake River system* (2009, *ESPA CAMP)*
- *~33% of all goods and services ($14.9 billion annually) are produced on the ESPA (2012, Division of Financial Management – Derek Santos, State Economist)*.
- Idaho's six-county "Magic Valley region" is ranked as a top 12 U.S. manufacturing community *(2015, Industry Week Magazine)*.
- Idaho is the 3rd largest milk producing state in the country (dairy industry contributes $2.2 billion to GDP) *(2012, Dairyman's Association)*.
- *Idaho's Aquaculture Industry raises 75% of the nation's trout*
- ESPA is the sole source of drinking water for majority of cities and rural residents on the ESPA.
- Providing water for DCMI uses is vital to the future growth of the state and local economies.

# Cumulative Change in Volume of Stored within the ESPA

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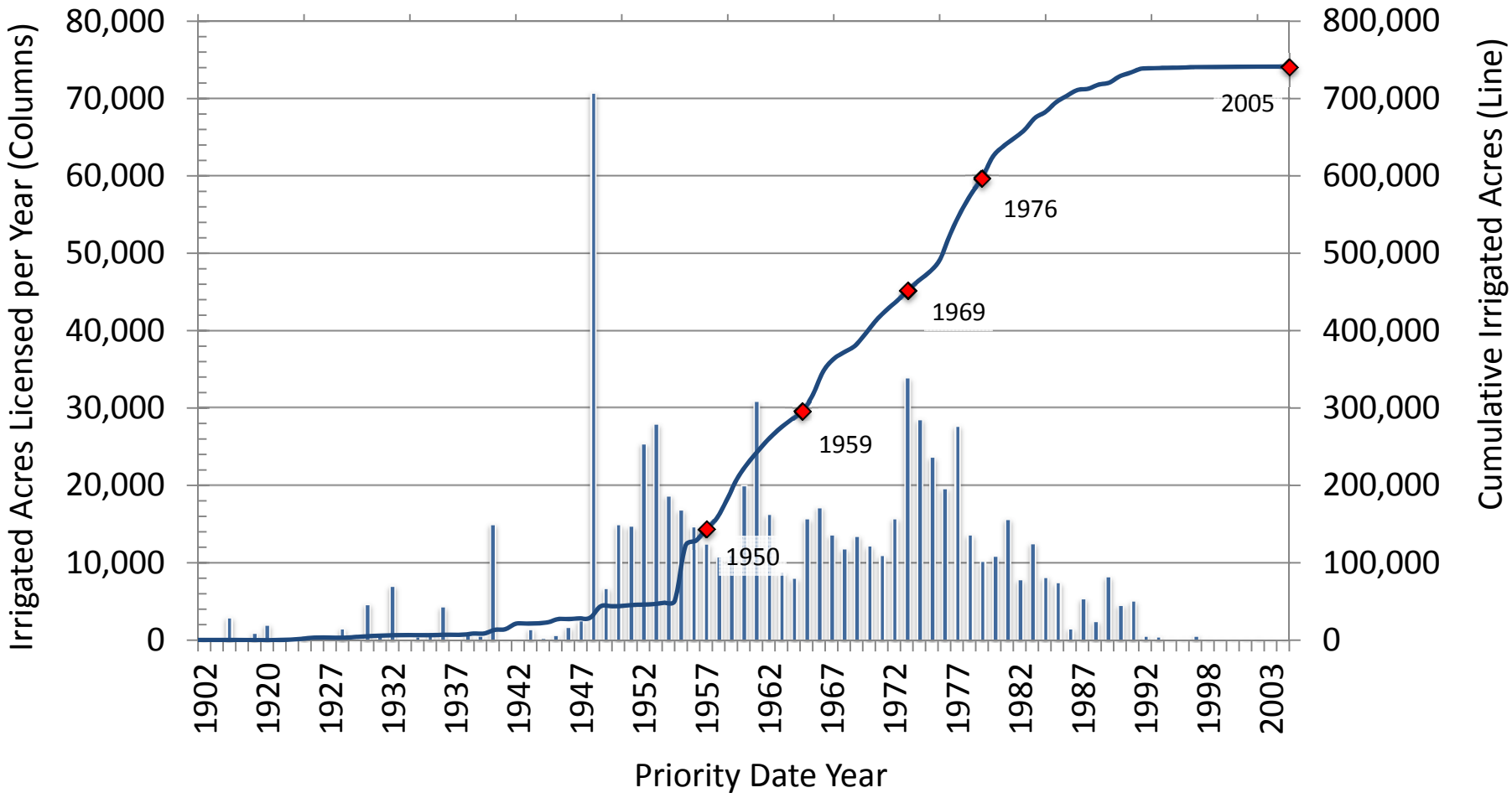
# Factors Effecting Declines in the ESPA

- Increase in GW Diversions
- Changing Climate: (1) drought cycles; and (2) declining precipitation
- Increase in surface water irrigation efficiencies (i.e. less incidental aquifer recharge)
- Winter Water Savings (i.e. Palisades Reservoir water supply, 1958)
- Flow Augmentation Releases (i.e. salmon recovery, 1992)

# Irrigated Acreage Development by Priority Date Year




**Cumulative Groundwater Irr. Acres within GWD from 1902 to Present ≈ 741,343 Acres**

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*Irrigated acreage is estimated by summing total WR diversion rates developed in a single year and assuming a standard duty of water of 0.02 CFS per acre.

# Precipitation and Change in Aquifer Storage (5-yr Moving Avg.)

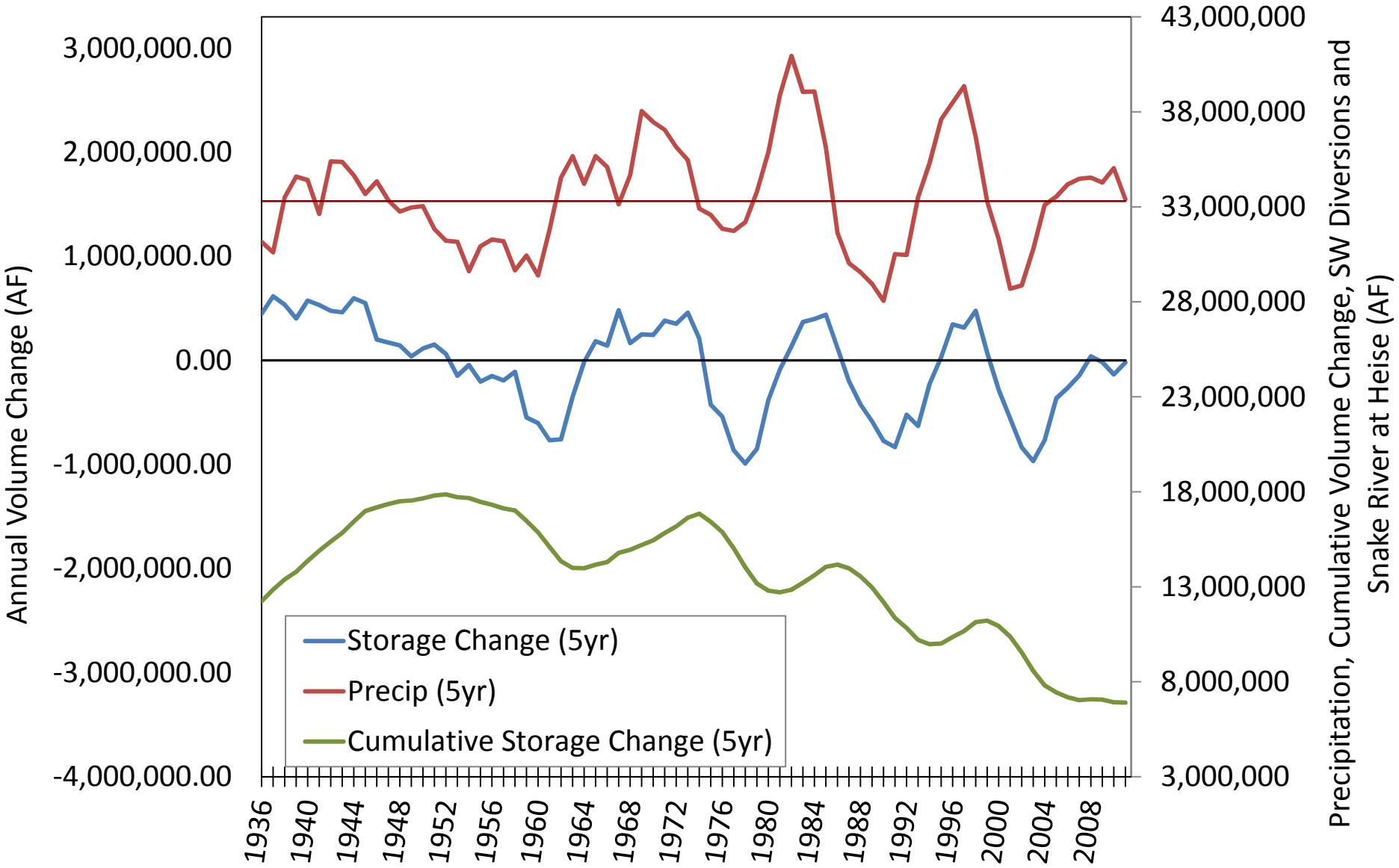
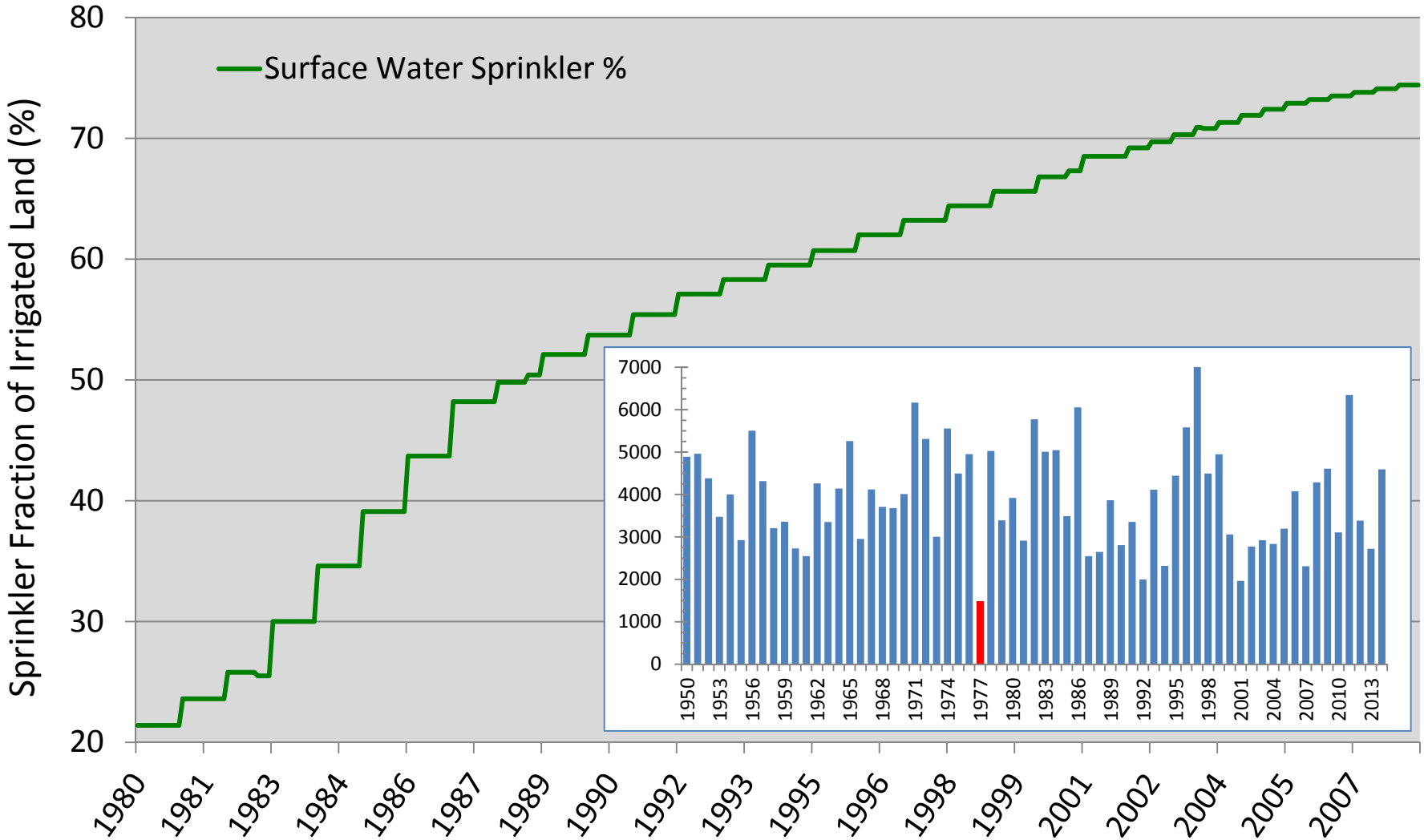



*Figure by Mike McVay, Idaho Department of Water Resources. Storage change is based on water-level measurements and ESPAM 2.1 model use. Precipitation data come from PRISM, and are tallied over the combined ESPA/tributary-basin area. Storage data come from Water District 01 historical water delivery records. Data available online at www.idwr.idaho.gov.

# Percent of Surface Water Irrigated Lands with Sprinkler Application

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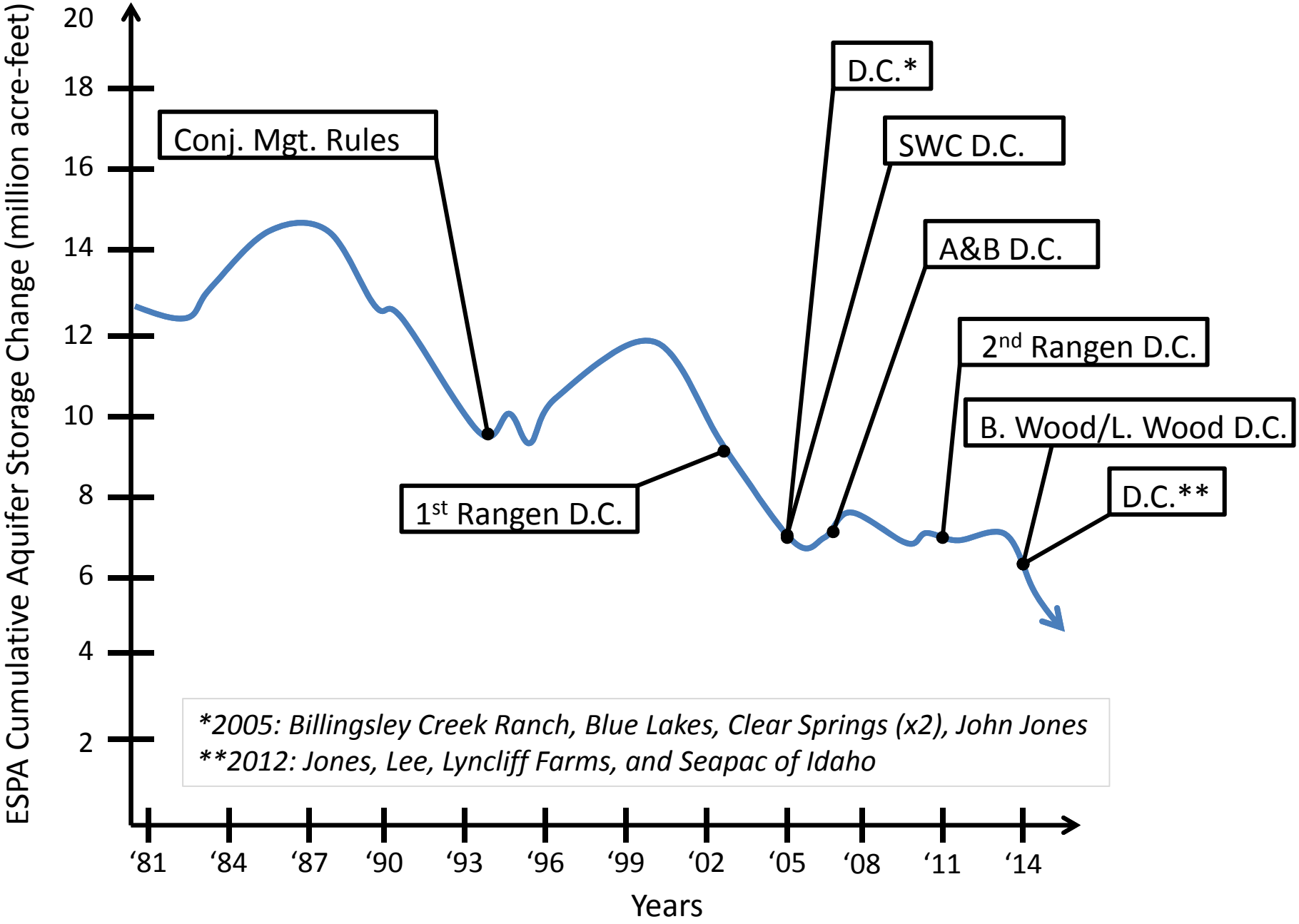
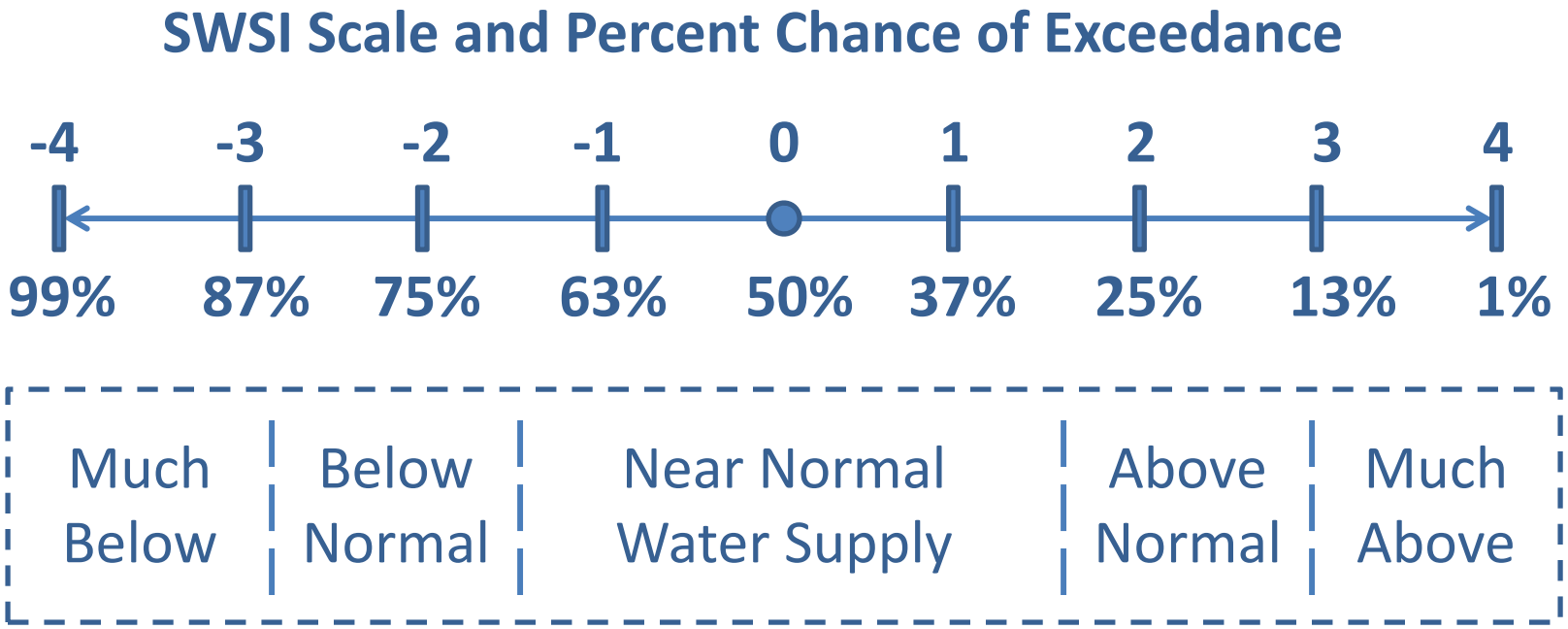
*Surface Water Sprinkler data from IDWR, 2013. Eastern Snake Plain Aquifer Model Version 2.1 Final Report. Idaho Department of Water Resources. Pgs. 113.

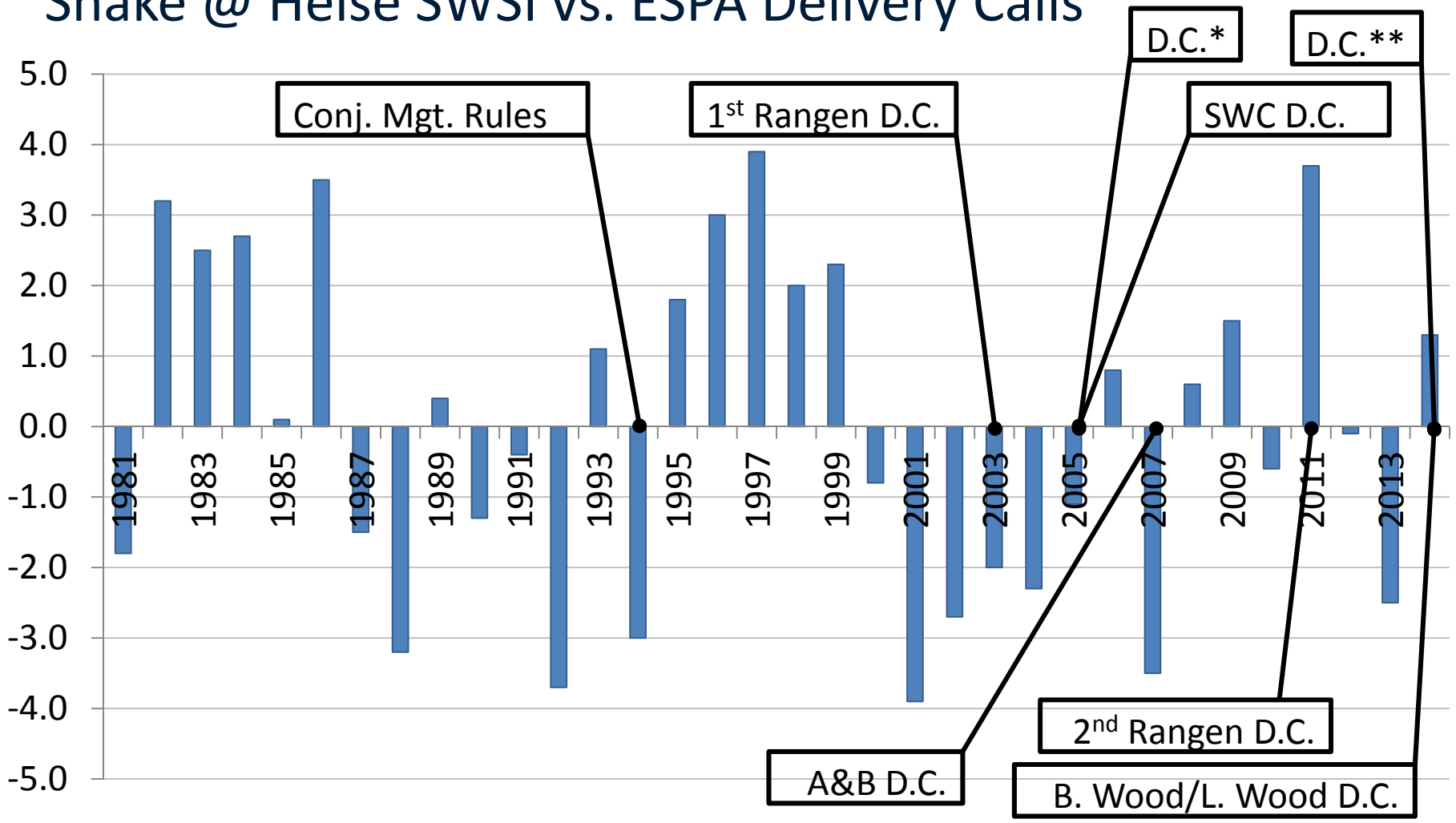
# Cumulative Change in Aquifer Volume vs. ESPA Delivery Calls



# Idaho Surface Water Supply Index (SWSI)



# Snake @ Heise SWSI vs. ESPA Delivery Calls




**2005: Billingsley Creek Ranch, Blue Lakes, Clear Springs (x2), John Jones*

***2012: Jones, Lee, Lyncliff Farms, and Seapac of Idaho*

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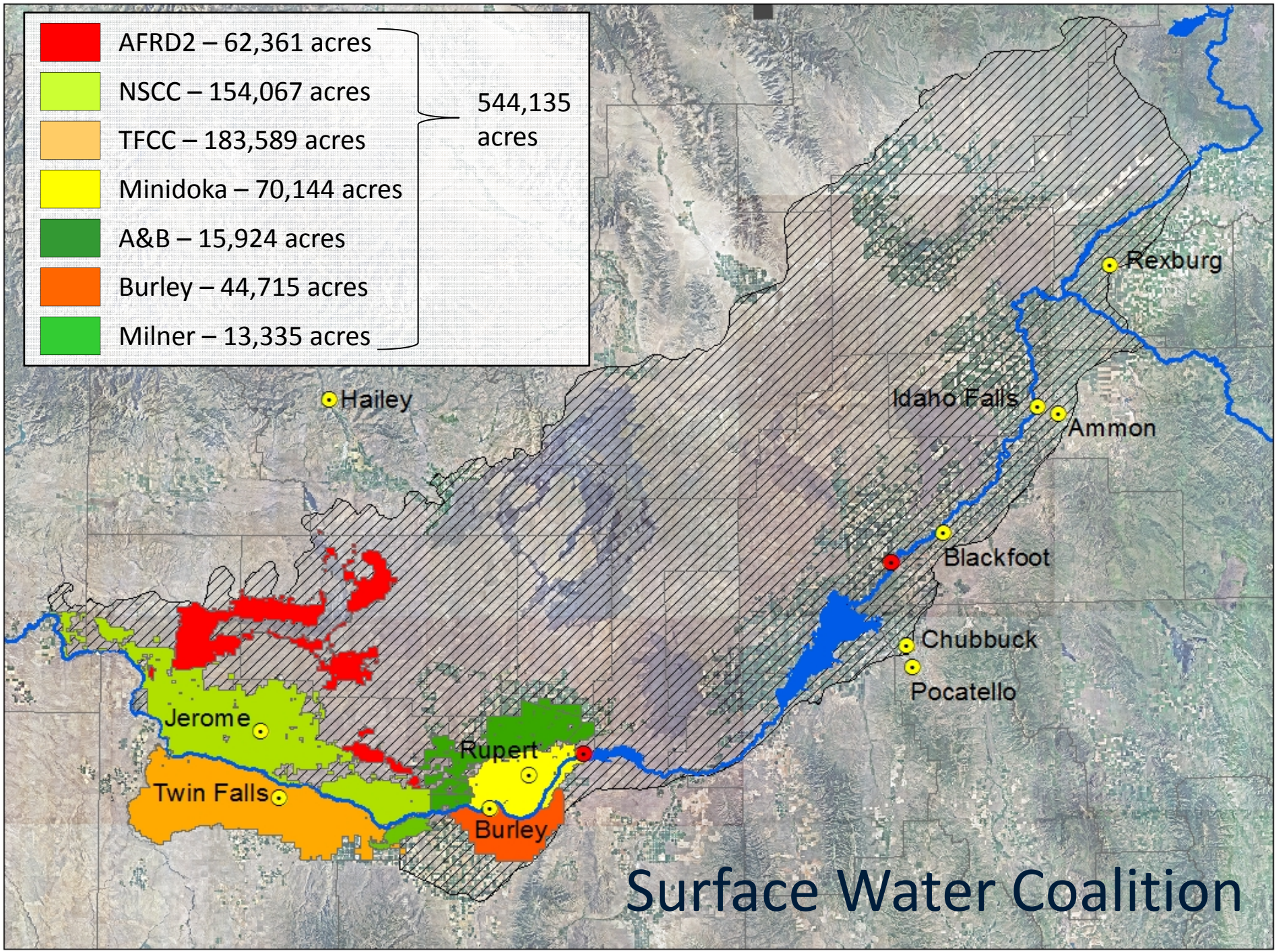
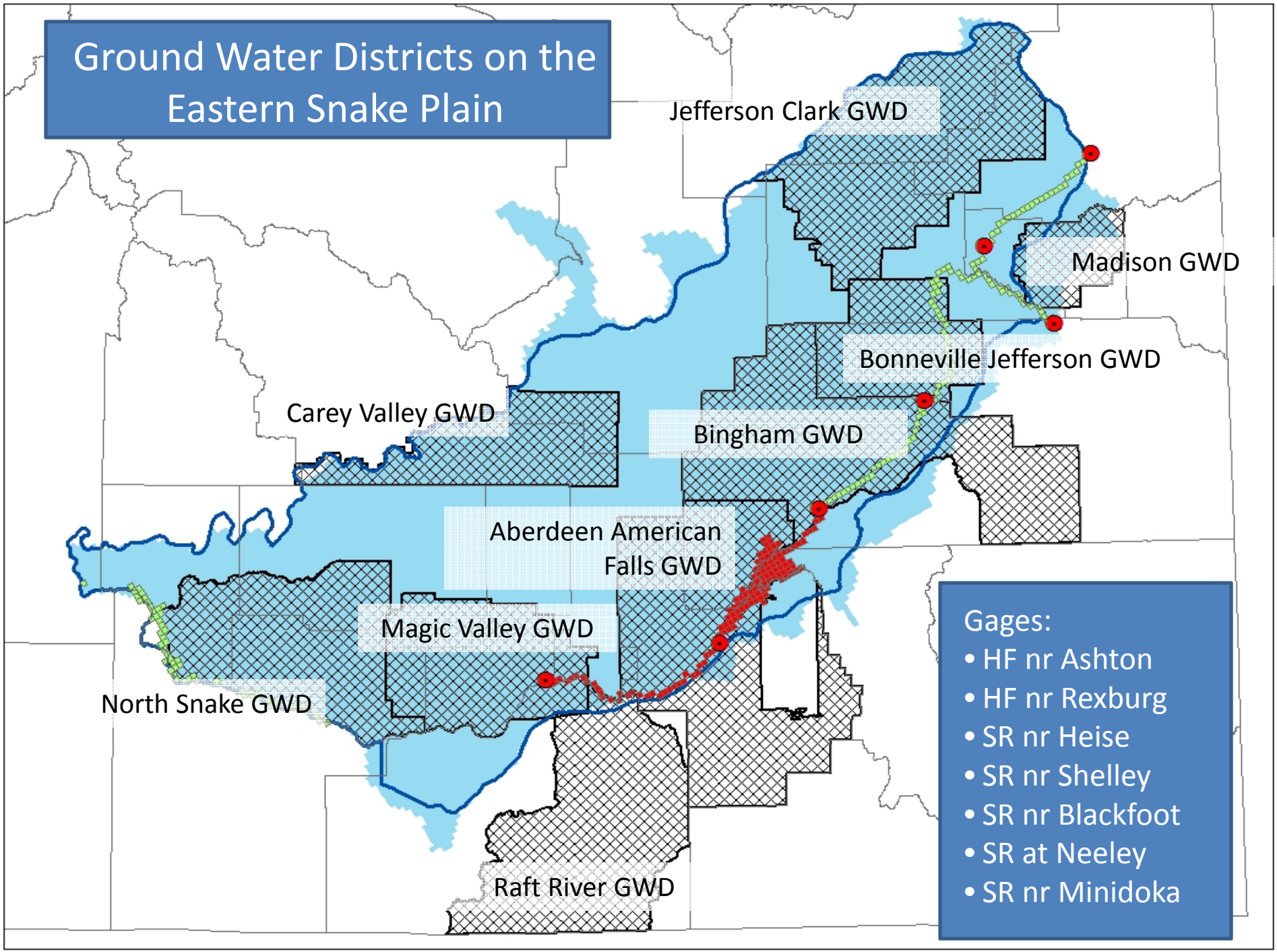
*Natural Resources Conservation Service, United States Department of Agriculture. Surface Water Supply Index Data set for the Snake River at Heise.

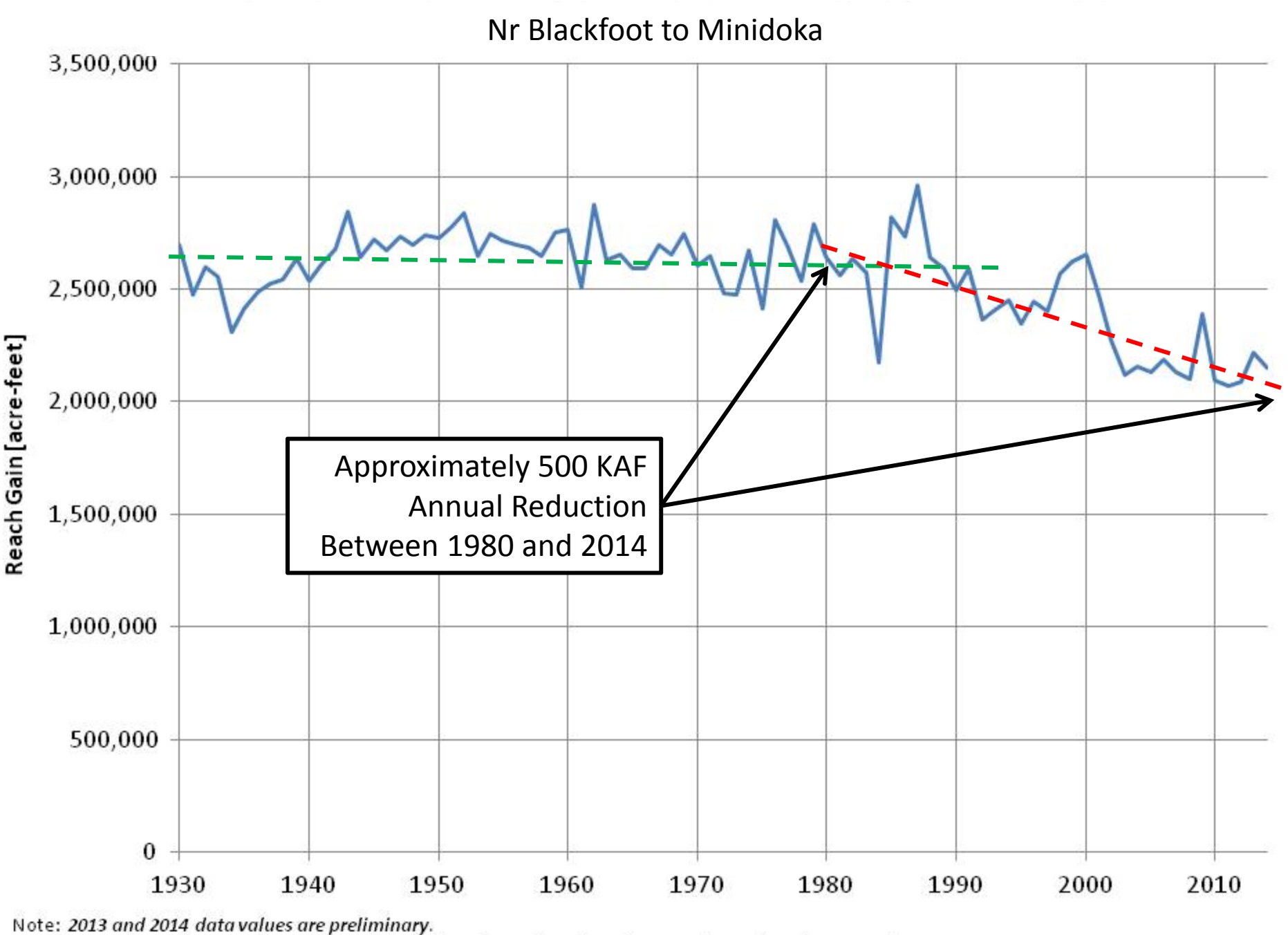
# Active Conjunctive Administration Delivery Calls on the ESPA

Update of Current ESPA Delivery Calls (DC):

- Rangen DC (Billingsley Creek)
- Misc. Hagerman Area DCs
- Big Wood and Little Wood River Water Users DCs
- Surface Water Coalition DC


AFRD2 – 62,361 acres
NSCC – 154,067 acres
TFCC – 183,589 acres
Minidoka – 70,144 acres
A&B – 15,924 acres
Burley – 44,715 acres
Milner – 13,335 acres
544,135 acres
Rexburg
Hailey
Idaho Falls
Ammon
Blackfoot
Chubbuck
Pocatello
Jerome
Rupert
Twin Falls
Burley
Surface Water Coalition


Ground Water Districts on the Eastern Snake Plain
Jefferson Clark GWD
Madison GWD
Bonneville Jefferson GWD
Carey Valley GWD
Bingham GWD
Aberdeen American Falls GWD
Magic Valley GWD
North Snake GWD
Raft River GWD
Gages:
• HF nr Ashton
• HF nr Rexburg
• SR nr Heise
• SR nr Shelley
• SR nr Blackfoot
• SR at Neeley
• SR nr Minidoka




Note: *2013 and 2014 data values are preliminary.*

# Surface Water Coalition Delivery Call

- Delivery Call Filed on 01/14/2005
- Final Order 09/05/2008
- Second Amended Methodology Order 06/23/2010
- Third Amended Methodology Order 04/16/2015
- Delivery Call Injury Based on Water Supply for Current Year
- Injury: (1) in-season; and (2) “reasonable carryover”
- Because the Water Supply changes from year to year, so does the injury obligation
- Uncertainty is the great frustration of the Junior…and the Senior

# How Does the Methodology Work

## IN-SEASON INJURY

- April – forecast the SWC's water supply
- April - forecast the SWC's demand (i.e. crop need)
- April – if demand > supply, in-season injury to the SWC exists and Juniors must mitigate or curtail
- July - repeat water supply/demand/injury analysis
- Aug/Sep - repeat water supply/demand/injury analysis

## CARRYOVER INJURY

- November - determine injury, if any, to "reasonable carryover" (up to 125,000 acre-feet)
- If injury to "reasonable carryover" exists, Juniors mitigate or curtail

# What Has Changed with the Third Amendment?

- No finality for the Junior until the “time of need”
- Full obligation from the Area of Common Ground Water Supply
- New Prediction Models Tied to Aquifer Levels
- New Crop Distribution Data
- No “phased curtailment” of injury to “reasonable carryover”
- New Baseline Years, based on hotter and drier years

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- New Methodology provides more assurance to the Senior
- New Methodology determines larger and more frequent injury early in the year, prior to final reservoir fill

Under the New Methodology the April 2015 Injury Determination was 89,000 acre-feet

Approximately 1982 Priority Date

Approximately 86,000 acres

But for the Stipulation, there Would be Curtailment Right Now!

| Summary of Demand Shortfall Projections as of May 3, 2015 | | | | |
|---|---|---|---|---|
| | April As-Applied Order (4/16/15) | April As-Applied w/ May 1 Forecast | July As-Applied w/ April Div. & BLY | July As-Applied w/ April Div. & 2012 Analog Yr. |
| A&B | 0 | 0 | 0 | 0 |
| AFRD2 | -15,300 | -35,464 | -54,728 | -67,938 |
| BID | 0 | 0 | 0 | 0 |
| Milner | 0 | 0 | 0 | 0 |
| Minidoka | 0 | 0 | 0 | 0 |
| NSCC | 0 | 0 | -26,327 | -184,543 |
| TFCC | -73,700 | -90,250 | -170,259 | -318,387 |
| **Total** | **-89,000** | **-125,714** | **-251,314** | **-570,868** |
| Approx. Curtailment Priority Date | 1982 | 1980 | 1974 | 1957 |
| Approx. Curtailed Acres | 86,000 | 121,000 | 259,000 | 594,000 |

These numbers are calculated using the 3rd Amended Methodology Order for the Surface Water Coalition Delivery Call. Natural flow supplies are predicted using the NRCS's May 1 50% Exceedance Forecast of April-July Runoff Volume at the Heise Gage (i.e. 2,239,000 AF).

# Settlement Agreement - Timeline

- May – Preliminary Agreement Reached by Parties, Delivery Call Orders Stayed
- July 2 - Parties legal counsel agreed to final settlement
- August 1 – All participating irrigation districts, canal companies, and ground water districts signed onto agreement as individual entities with conditions of understanding
- September – IGWA and GWDs held 1st and 2nd Technical Workshops to begin implementing the Term Sheet
- October – All participating irrigation districts, canal companies, and ground water districts finalized signatures to the agreement

# Final Settlement Agreement

1. **Objectives**
   - Mitigate for material injury to senior water users in the Surface Water Coalition (SWC) Delivery Call
   - Provide safe harbor to participating ground water users in participating Ground Water Districts (GWD)
   - Minimize economic impact to water users and State economy
   - Increase reliability and enforcement of use, measurement, and reporting across the Eastern Snake Plain (ESP)
   - Develop adaptive management plan to stabilize and enhance the Eastern Snake Plain Aquifer (ESPA) ground water levels

# Final Settlement Agreement

**2. Near Term Practices (i.e. 2015 irrigation year)**

- 110,000 AF storage water
  - Satisfied in-season mitigation obligation
  - All rental contracts in to WD01 by July 1

- $1.1 Million dedicated to conversion projects

# Final Settlement Agreement

3. **Long Term Practices (i.e. 2016 and beyond)**
   - Consumptive use reduction of ground water by 240,000 AF
   - Annual storage water delivery of 50,000 AF
   - Irrigation season reduction: April 1 – October 31
   - Mandatory Measurement Devices by 2018
   - Support state sponsored recharge program of 250 KAF annually
   - Additional support for the following: NRCS conservation programs; new conversion projects; management of Trust Water Rights; and participation in review and possible recommendations of changes to IDWR administrative processes on the ESPA.

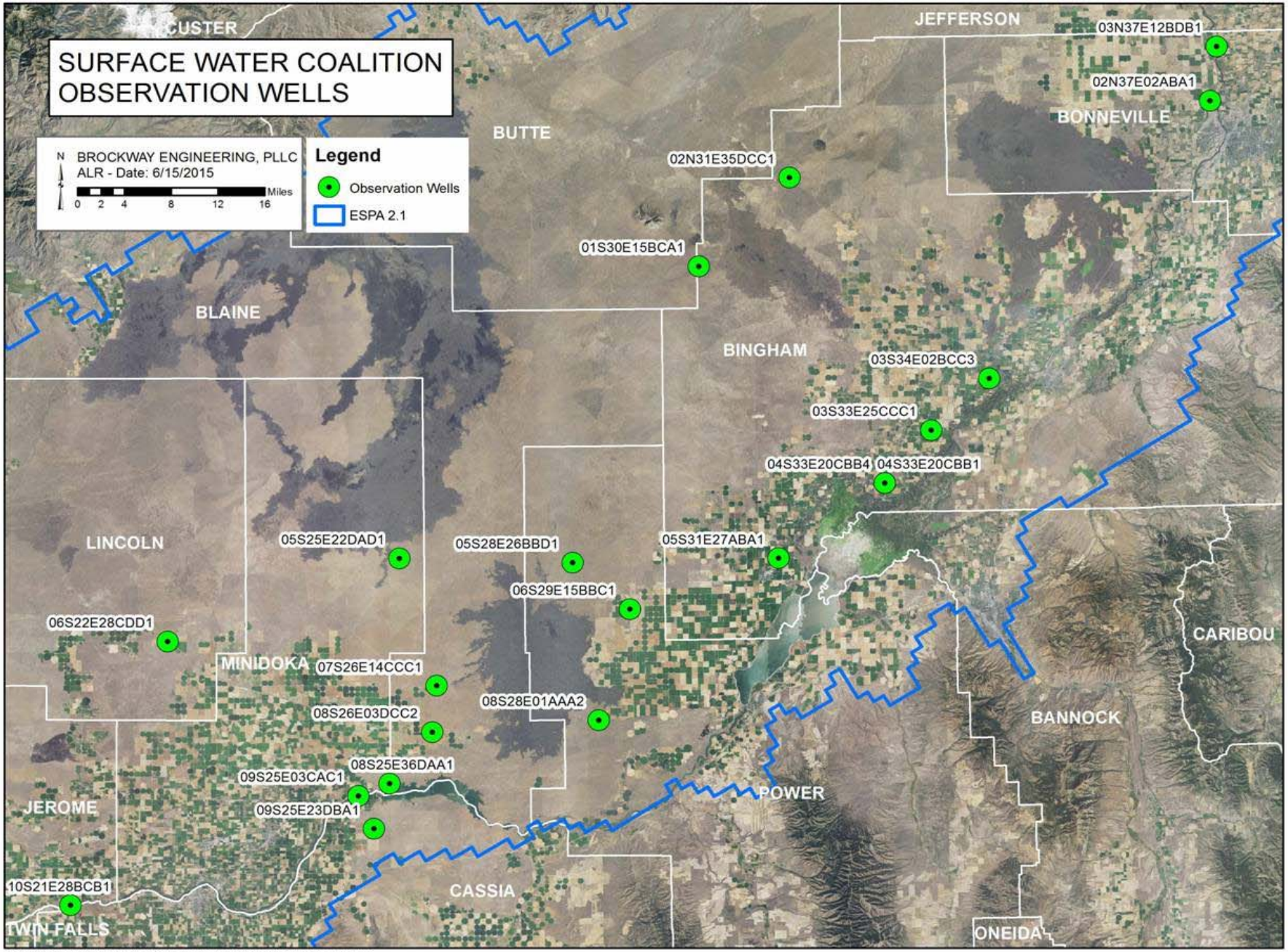
# Final Settlement Agreement – Goal and Benchmarks

## 3. Term Sheet Benchmarks and Ground Water Level Goal

- Goal: "stabilize and ultimately reverse the trend of declining ground water levels and return ground water levels to levels equal to the average ground water levels from 1991-2001"

- Benchmarks: (1) by 2020 ground water levels will equal ground water levels in 2015; (2) by 2023 ground water levels will be halfway between 2015 ground water levels and goal; and (3) by 2026 goal is reached and ground water levels equal or exceed 1991-2001 average.

- Metrics: ground water levels as measured in 19 mutually agreed to "sentinel" observation wells



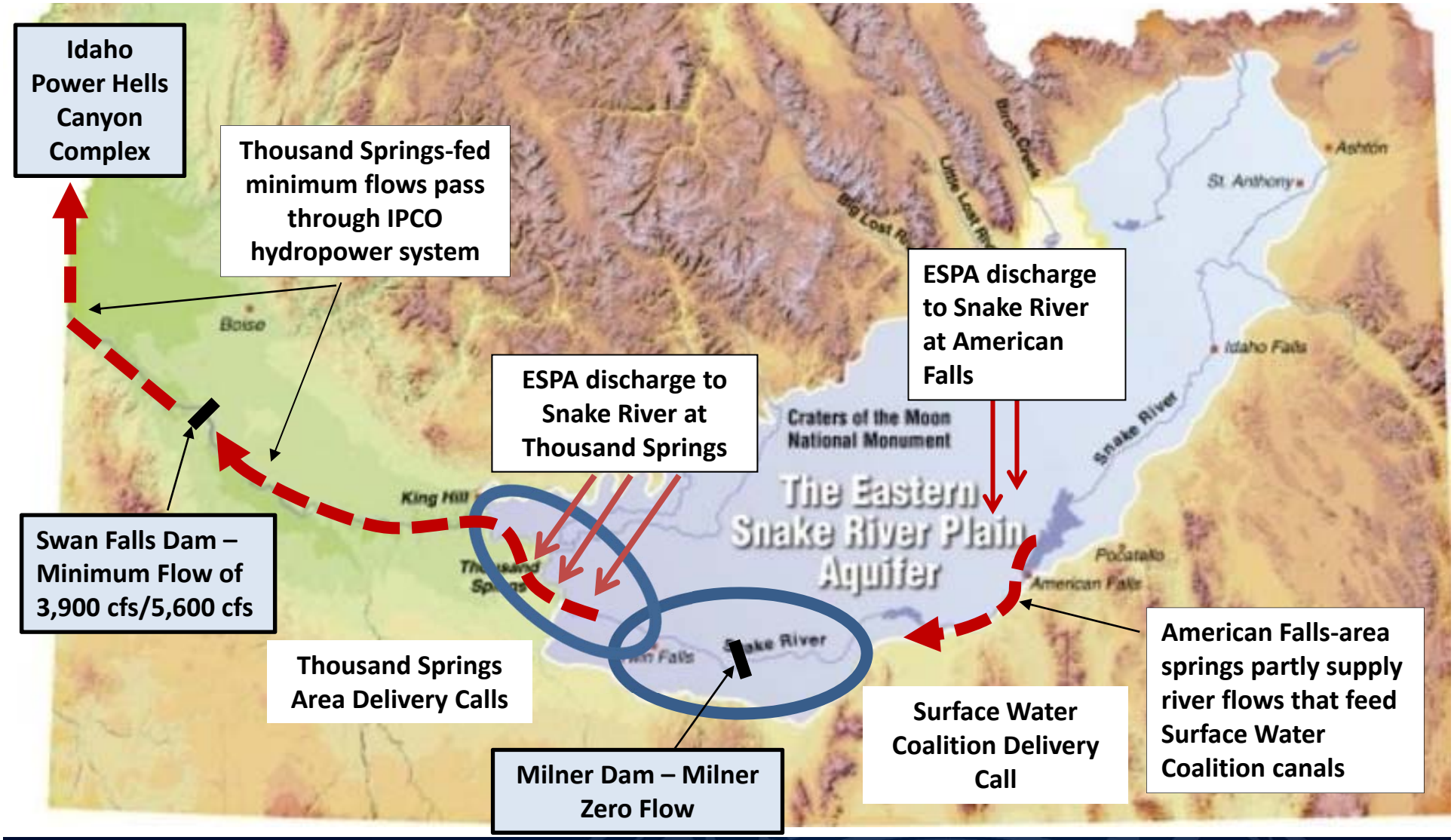

Path: F:\Projects\Surface Water Coalition\Arcview 9\observation well map.mxd

# Final Settlement Agreement

**4. Adaptive Water Management Measures**

*"If any of the benchmarks or the ground water level goal is not met, additional recharge, consumptive use reduction, or other measures as recommended by the Steering Committee shall be implemented by the participating ground water parties to meet the benchmarks or ground water level goal"*

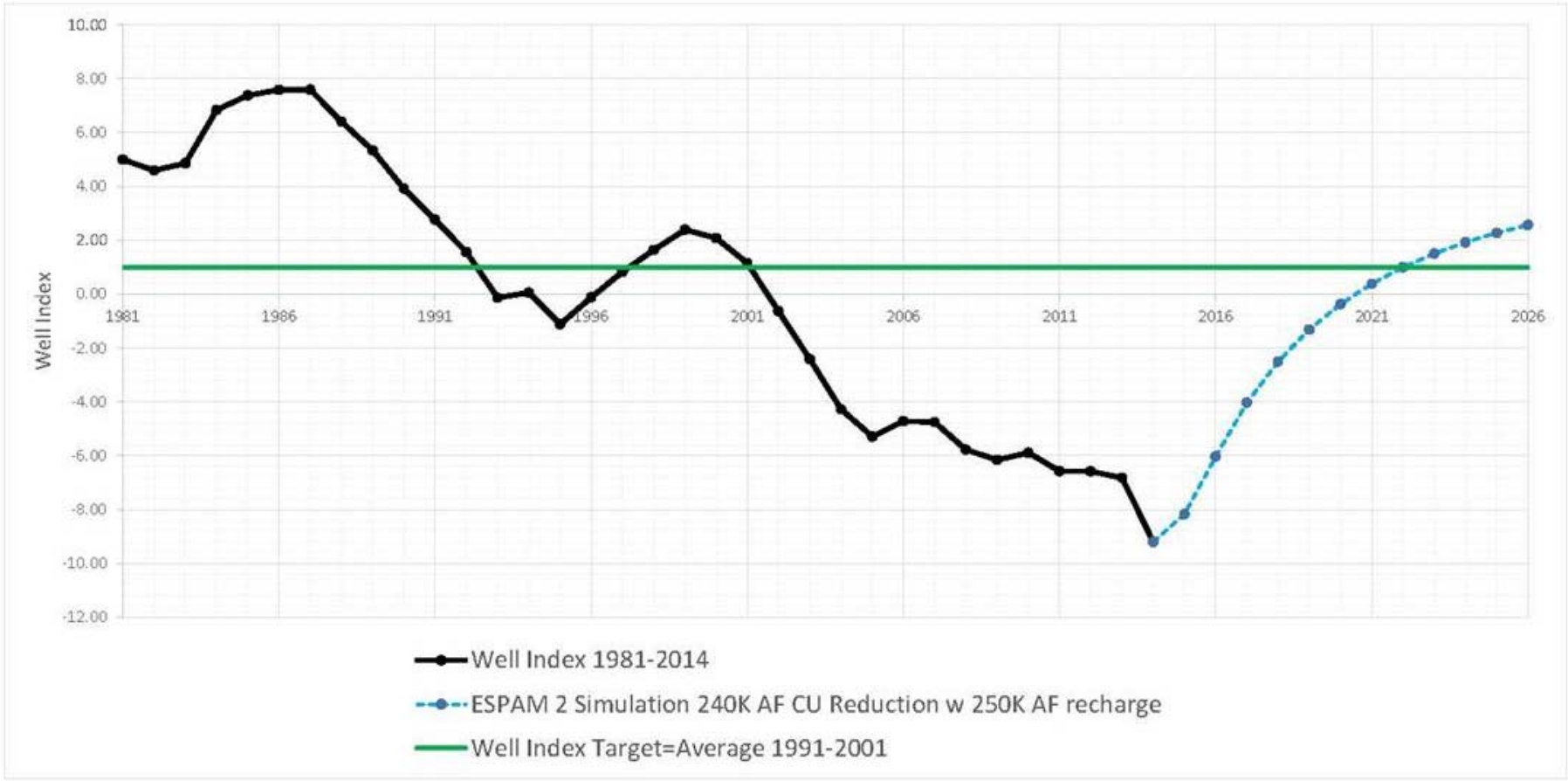
# ESPA and the Snake River – A Combined System



# Increased Ground Water Levels: 19 Sentinel Wells

7/15/2015

**Figure 1:** IGWA-SWC Well Index with ESPAM2 Simulated Benefit from 240K AF of Consumptive Use Reduction & 250K AF Recharge

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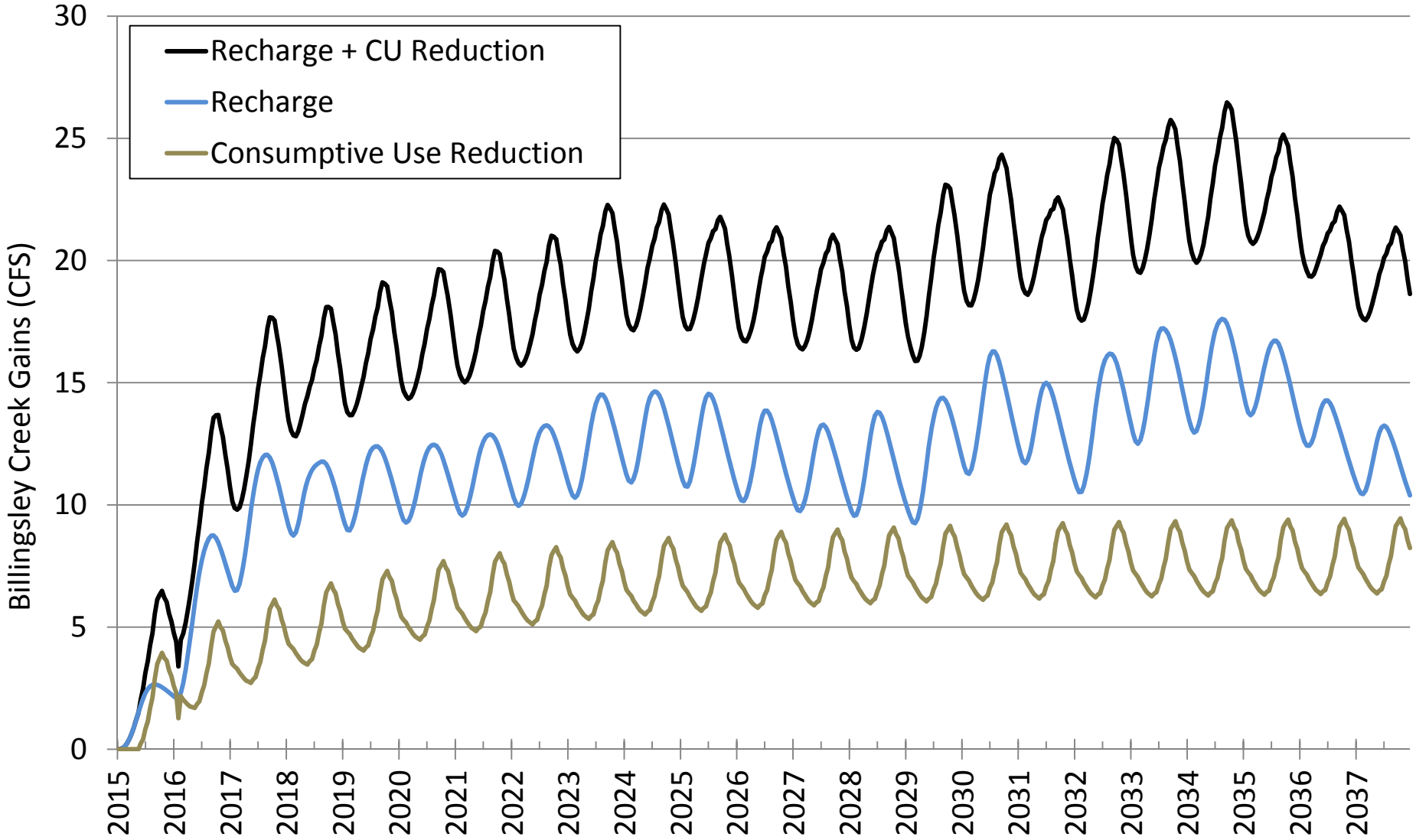
*Analysis, modeling results, and figure conducted and prepared by Lynker Technologies in support of the Surface Water Coalition Term Sheet.

# Increased Reach Gains: Billingsley Creek

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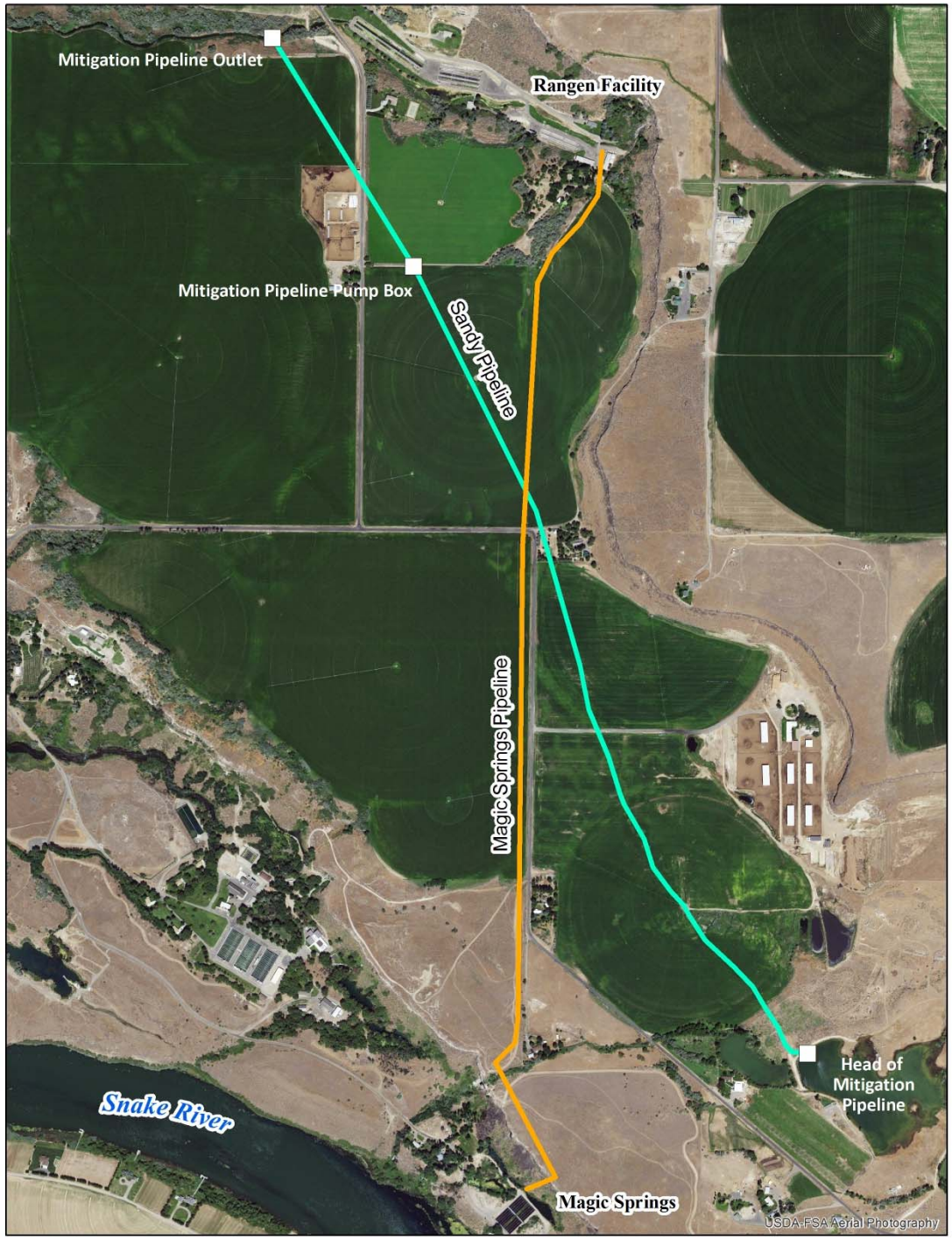
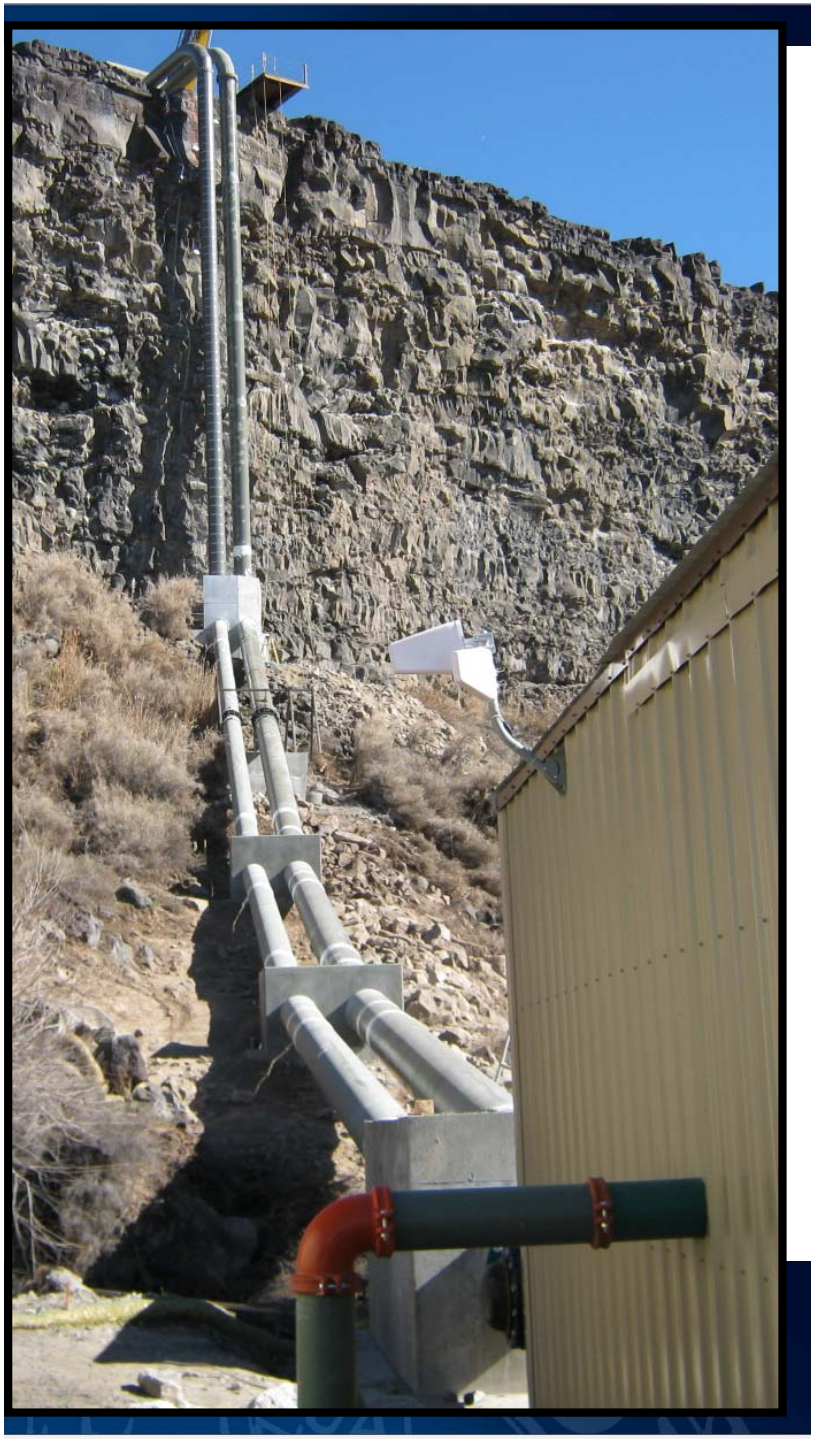

Mitigation Pipeline Outlet
Rangen Facility
Mitigation Pipeline Pump Box
Sandy Pipeline
Magic Springs Pipeline
Head of Mitigation Pipeline
Snake River
Magic Springs
USDA FSA Aerial Photography



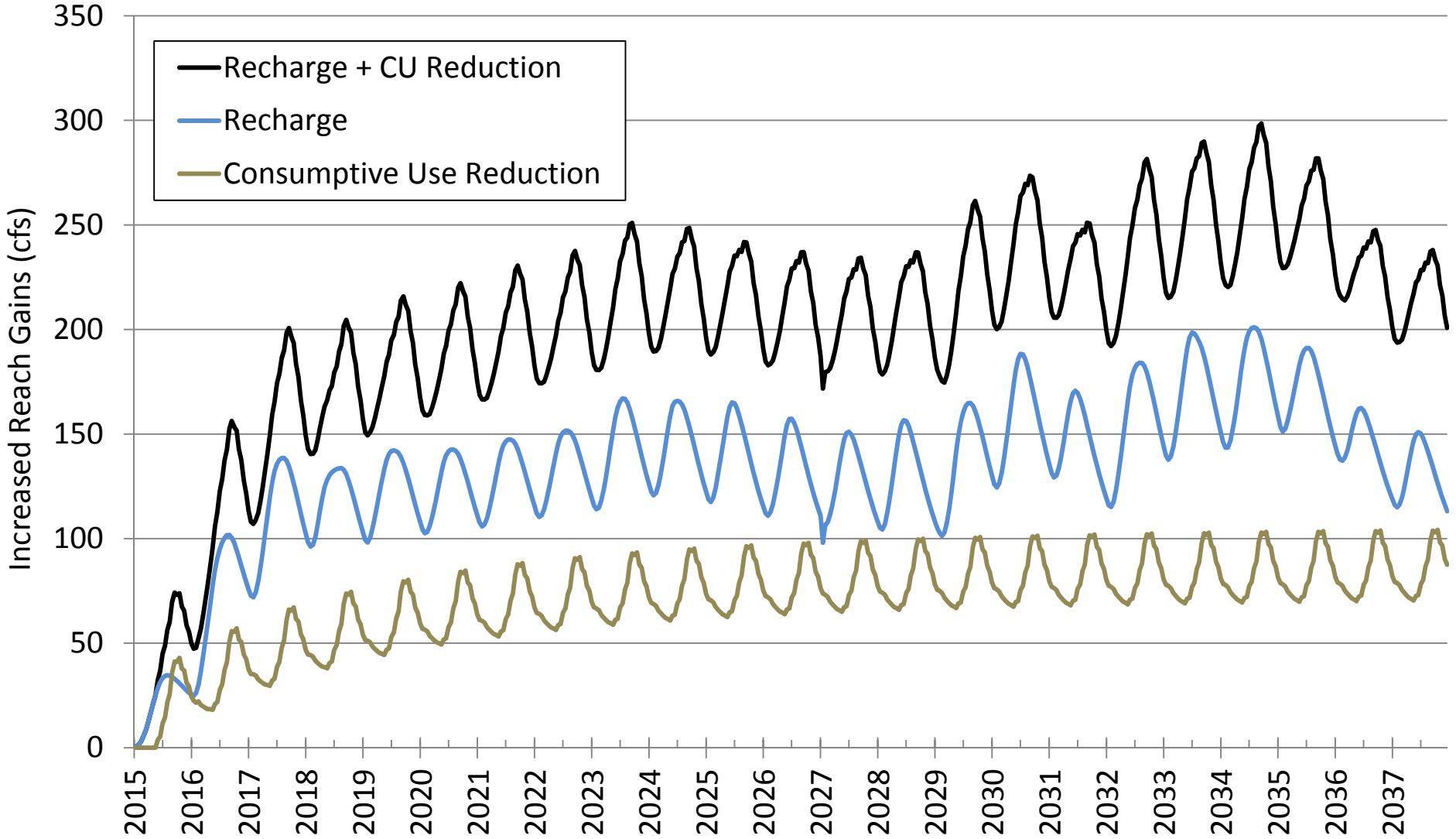
# Thousand Springs Restoration Framework (Draft)

- Billingsley Creek Component
  - 10 CFS to Head of Billingsley Creek
  - Curren Ditch Exchange Water
  - NSCC Tail Water
- Spring Component
  - Delivery of substitute water
  - Lease/subordination agreements
- **Above the Rim Component**
  - Conservation Program ★
  - Recharge Program ★
- Adaptive Management Component
  - Defined Goals/Monitoring/Steering Comm.



★ ***SWC Term Sheet addresses these Components of the framework.***

# Increased Reach Gains: Swan Falls Minimum Flow

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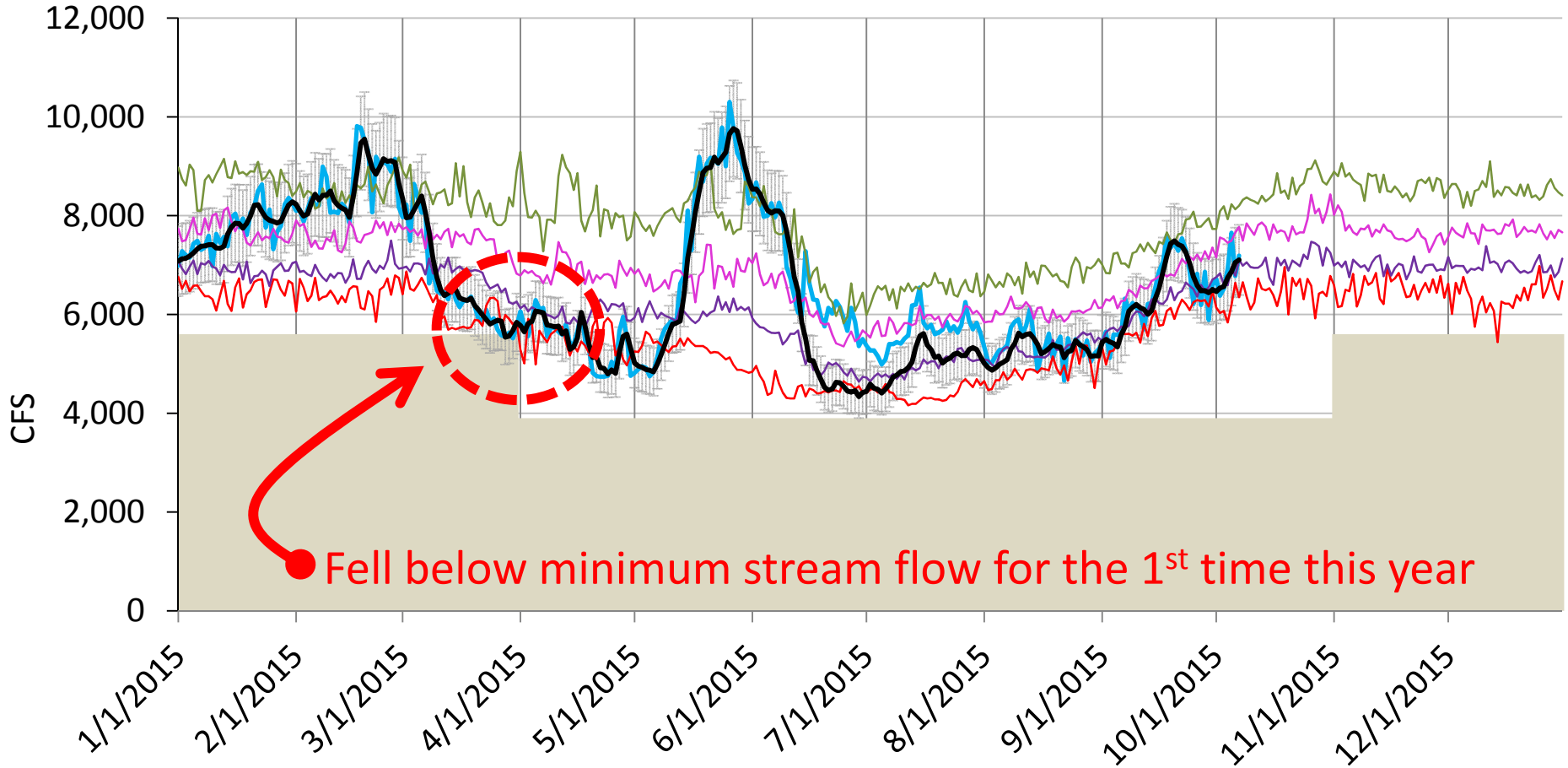
*Analysis, ESPAM v2.1 modeling, and figure preparation by Mike McVay, Idaho Department of Water Resources. IDWR, 2015.

# Summary Hydrograph Snake River NR Murphy 1081-2015




Minimum Streamflow at the Murphy Gaging Station

Unadjusted Average Daily Flow 2015

Minimum of Record (1981-2014)

10th Percentile (1981-2014)

30th Percentile (1981-2014)

Median (1981-2014)

3-day Average of the Adjusted Average Daily Flow (AADF)

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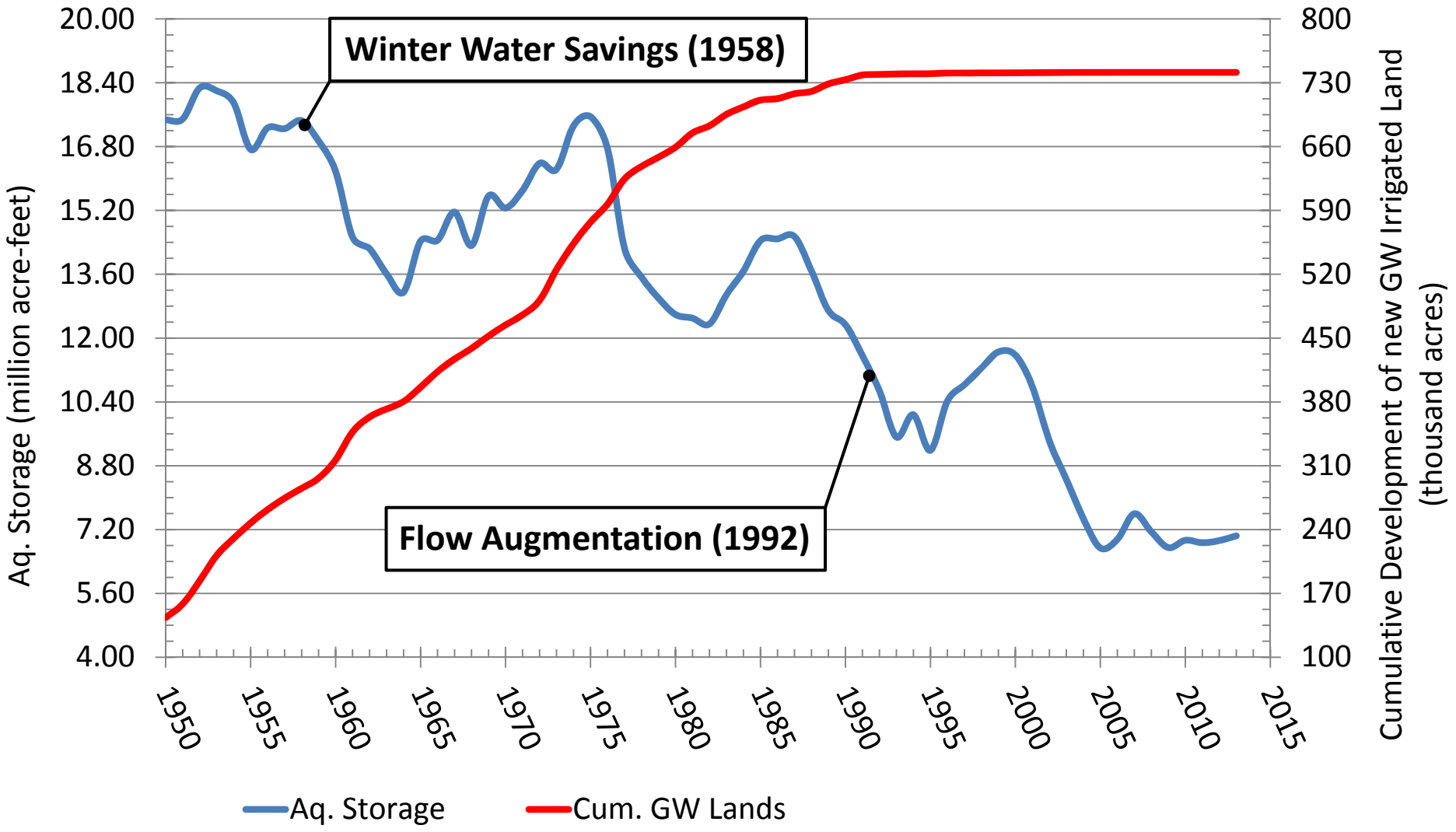
# The End

# Bonus Slides

# Aquifer Storage and Cum. GW Irrigation Development

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